Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A bone implantable device for locating adjacent a target bone structure, said bone implantable device comprising:

a body defining an outside surface;

a carrier receiving area defined by said body;

an un-doped carrier material loaded in said carrier receiving area, said un-doped carrier material to bind with a biologically active substance;

a port that communicates said outside surface with said carrier receiving area for facilitating delivery of a biologically active substance onto said un-doped carrier material;

a pathway that communicates with said carrier receiving area for delivering said biologically active substance from said carrier receiving area to a target bone structure.

2. (Original) The bone implantable device according to claim 1 further comprising:

a plug in said port adapted to be penetrated by a syringe.

3. (Withdrawn) The bone implantable device according to claim 1 further comprising:

a plenum in communication with said port, said plenum extending into said carrier receiving area for distributing said biologically active substance received through said injection port into said carrier receiving area.

4. (Original) The bone implantable device according to claim 1 wherein:

said body comprises a cage body of a spinal fusion cage.

5. (Withdrawn) The bone implantable device according to claim 1 wherein:

said body comprises a body of a facet fusion screw.

6. (Withdrawn) The bone implantable device according to claim 1 wherein:

said body comprises a body of an artificial joint.

7. (Withdrawn) The bone implantable device according to claim 1 wherein:

said body comprises a body of a bone fixation plate.

8. (Withdrawn) The bone implantable device according to claim 1 wherein:

said body comprises a body of an interbody graft.

9. (Withdrawn) The bone implantable device according to claim 1 wherein:

said body comprises a body of an IM nail.

10. (Withdrawn) The bone implantable device according to claim 1 wherein:

said body comprises a body of a hip stem.

11. (Original) The bone implantable device according to claim 1 wherein:

said body comprises a body of a bone-to-bone orthopedic appliance.

12. (Original) The bone implantable device according to claim 1 wherein:

said body comprises a body of a bone-to-device orthopedic appliance.

13. (Original) The bone implantable device according to claim 1 wherein:

said body comprises a cage wall having perforated zones and non-perforated zones.

14. (Currently Amended) A method of implanting a bone implantable device comprising the steps of:

installing a carrier into a carrier receiving area of a bone implantable device;

implanting the bone implantable device adjacent a target bone structure;

applying biologically active substance onto said carrier after said step of implanting for subsequent delivery to said target bone structure.

15. (Original) The method according to claim 14 further comprising the steps of:

applying said carrier into said carrier receiving area prior to said step of implanting.

16. (Original) The method according to claim 14 further comprising the steps of:

injecting said biologically active substance through an injection port into said carrier receiving area.

17. (Withdrawn) The method according to claim 14 further comprising the steps of:

injecting said biologically active substance into a plenum for increasing

he evenness of distribution of said biologically active substance throughout said carrier receiving area.

18. (Currently Amended) [[A]] An interbody spine fusion cage for fusing adjacent vertebrae, said spinal fusion cage comprising:

a cage body defining an outside surface;

a carrier receiving area defined by said cage body;

an un-doped carrier material loaded in said carrier receiving area;

a port that communicates said outside surface with said carrier receiving area for facilitating delivery of a biologically active substance onto said un-doped carrier material to bind said biologically active substance with said carrier material;

a pathway that communicates with said carrier receiving area for delivering said biologically active substance from said carrier receiving area to a target bone structure.

19. (Original) The interbody spine fusion cage according to claim 18 further comprising:

a plug in said port adapted to be penetrated by a syringe.

20. (Original) The interbody spine fusion cage according to claim 18 further comprising:

an end cap on an end of said cage body for enclosing said carrier receiving area; and

wherein said port is defined by said end cap.

21. (Currently Amended) ~~The interbody spine fusion cage according to claim 20 further comprising~~ An interbody spine fusion cage for fusing adjacent vertebrae, said spinal fusion cage comprising:

a cage body defining an outside surface;

a carrier receiving area defined by said cage body;

an un-doped carrier material loaded in said carrier receiving area;

a port that communicates said outside surface with said carrier receiving area for facilitating delivery of a biologically active substance onto said un-doped carrier

material;

a pathway that communicates with said carrier receiving area for delivering said biologically active substance from said carrier receiving area to a target bone structure;

an end cap on an end of said cage body for enclosing said carrier receiving area;

wherein said port is defined by said end cap; and further comprising:

a plug in said port adapted to be penetrated by a ~~syringe~~ delivery device.

22. (Withdrawn) The interbody spine fusion cage according to claim 18 further comprising:

a plenum in communication with said port, said plenum extending into said carrier receiving area for distributing said biologically active substance received through said port into said carrier receiving area.

23. (Original) The interbody spine fusion cage according to claim 18 wherein:

said passageway is comprised of an aperture defined by said cage body.

24. (Original) The interbody spine fusion cage according to claim 18 wherein:

said cage body comprises a cage wall having perforated zones and non-perforated zones.

25. (Withdrawn) An interbody spine fusion cage for promoting fusion between adjacent bone structures, comprising:

a cage body having a posterior end and an anterior end and defining an internal cavity, the cage body further having an outer surface and a plurality of apertures extending through the outer surface in communication with the internal cavity, the outer surface comprising a preselected pattern of perforated and non-perforated areas, wherein, upon implantation, a perforated area is in contact with an adjacent bone structure while all areas of the cage body not in contact with adjacent bone structure are non-perforated; and

a non-perforated end closure at each end of said cage body, at least one of the end closures being movable so as to provide access to the internal cavity.

26. (Withdrawn) The interbody spine fusion cage according to claim 25, further comprising an upper perforated area for locating adjacent an upper bone structure to be

fused and a lower perforated area for locating adjacent a lower bone structure to be fused, wherein said upper perforated area and said lower perforated area are separated exclusively by non-perforated areas.

27. (Withdrawn) The interbody spine fusion cage according to claim 25, wherein:

said non-perforated zones are on lateral sides of the cage and extend in opposing relation from the posterior end toward the anterior end; and

said perforated areas comprise two opposed perforated areas oriented so that upon insertion the perforated areas are adjacent the bone structures to be fused.

28. (Withdrawn) An apparatus for insertion into a vertebral interspace between adjacent vertebral bodies to facilitate arthrodesis between bone structures of the adjacent vertebral bodies while preventing bony overgrowth toward neural elements, comprising:

a cage body having a posterior end and an anterior end and defining an internal cavity, the cage body further having an outer surface and a plurality of apertures extending through the outer surface in communication with the internal cavity in areas of the outer surface which, upon implantation of the apparatus, allow for arthrodesis between the bone structures;

wherein no area of the cage body directed toward neural elements upon implantation of the apparatus are not in communication with the internal cavity so as prevent bony overgrowth toward the neural elements.

29. (Withdrawn) The apparatus of claim 25, further comprising:

means on the cage body for aiding insertion of the cage body between adjacent vertebral bodies.

30. (Withdrawn) The apparatus of claim 25, further comprising:

a non-perforated removable end cap securable to the posterior end of the cage body.

31. (Withdrawn) In a body having vertebral bodies defining a central canal, a spinal cord located in the central canal, neural elements branching out from said spinal cord through openings between the vertebral bodies, an arthrodesis facilitating therapeutic combination comprising:

a cage body inserted between the adjacent vertebral bodies, said cage body having a posterior end and an anterior end and defining an internal cavity, the cage

body further having an outer surface that forms a periphery of said cage body, said outer surface having at least one aperture formed therein, said aperture adjacent the vertebral bodies to be fused to allow bone growth across the vertebral interspace;

a longitudinal occluded area on said cage body, said occluded area for preventing communication between said internal cavity and said outer surface; and

wherein said longitudinal occluded area shields the neural elements from said internal cavity so that bone can grow only into the vertebral bodies and away from the neural elements.

32. (Withdrawn) An apparatus for insertion between adjacent vertebral bodies to facilitate arthrodesis between bone structures of the adjacent vertebral bodies while preventing bony overgrowth toward neural elements, comprising:

a cage body having a posterior end and an anterior end and defining an internal cavity, the cage body further having an outer surface that forms a periphery of said cage body, said outer surface having a plurality of apertures formed therein;

wherein one of said posterior end and said anterior end is a non-perforate surface and one of said posterior end and said anterior end is an open end;

an end closure for locating at said open end of said cage body, said end

closure having a longitudinal occluding surface for selectively occluding apertures such that a longitudinal portion of said cage body from a posterior end to an anterior end is occluded, said longitudinal occluding surface sized to provide an occluded portion of sufficient size to prevent bone growth from impinging on neural tissue when said cage body is inserted between adjacent vertebral bodies.

33. (Withdrawn) A cage to promote bony fusion of adjacent vertebral bodies comprising:

a cage body having a posterior end, an anterior end and an outer surface, said cage body defining an internal cavity and at least one aperture extending through said outer surface, said aperture in communication with said internal cavity;

a first non-perforated zone on said cage body, said first non-perforated zone extending from said posterior end of said cage body a preselected length toward said anterior end;

a first lateral side of said cage body and a second lateral side of said cage body extending in opposing relation from said first zone further toward said anterior end;

a second non-perforated zone on said first lateral side of said cage body

extending from said first zone further toward said anterior end;

a third non-perforated zone on said second lateral side of said cage body extending in opposing relation with respect to said second non-perforated zone and extending from said first zone further toward said anterior end; and

two opposed perforated zones oriented so that upon insertion of said cage body between the adjacent vertebral bodies, the perforated zones adjacent the vertebral bodies to be fused for allowing bone growth across a vertebral interspace between the adjacent vertebral bodies.

34. (Withdrawn) The cage according to claim 33 wherein:

a center of said second non-perforated zone is offset approximately 90 degrees from a center of said two opposed perforated zones.

35. (Currently Amended) An implantable device for locating within a body, said implantable device comprising:

a body defining an outside surface;

a carrier receiving area defined by said body;

an un-doped carrier material loaded in said carrier receiving area, said un-

doped carrier material to bind to a biologically active substance;

a port that communicates said outside surface with said carrier receiving area for facilitating delivery of [[a]] said biologically active substance onto said un-doped carrier material;

a pathway that communicates with said carrier receiving area for delivering said biologically active substance from said carrier receiving area to a target bone structure.

36. (Original) The implantable device according to claim 35 further comprising:

a plug in said port adapted to be penetrated by a syringe.

37. (Withdrawn) The implantable device according to claim 35 further comprising:

a plenum in communication with said port, said plenum extending into said carrier receiving area for distributing said biologically active substance received through said injection port into said carrier receiving area.

38. (Currently Amended) A bone implantable device for locating adjacent a target bone structure, said bone implantable device comprising:

a body defining an outside surface;

a carrier receiving area defined by said body;

a pre-loaded carrier material in said carrier receiving area, said pre-loaded carrier material comprising a fluidal biologically active substance;

a pathway that communicates with said carrier receiving area for delivering said biologically active substance from said carrier receiving area to the target bone structure.

39. (Previously Presented) The bone implantable device according to claim 38 wherein:

said carrier receiving area is an interior volume defined by said body.

40. (Previously Presented) The bone implantable device according to claim 38 wherein:

said body comprises a cage body of a spinal fusion cage.

41. (Withdrawn) The bone implantable device according to claim 38 wherein:

said body comprises a body of a facet fusion screw.

42. (Withdrawn) The bone implantable device according to claim 38 wherein:

said body comprises a body of an artificial joint.

43. (Withdrawn) The bone implantable device according to claim 38 wherein:

said body comprises a body of a bone fixation plate.

44. (Withdrawn) The bone implantable device according to claim 38 wherein:

said body comprises a body of an interbody graft.

45. (Withdrawn) The bone implantable device according to claim 38 wherein:

said body comprises a body of an IM nail.

46. (Withdrawn) The bone implantable device according to claim 38 wherein:

said body comprises a body of a hip stem.

47. (Previously Presented) The bone implantable device according to claim 38 wherein:

said body comprises a body of a bone-to-bone orthopedic appliance.

48. (Previously Presented) The bone implantable device according to claim 38 wherein:

said body comprises a body of a bone-to-device orthopedic appliance.

49. (Previously Presented) The bone implantable device according to claim 38 wherein:

said body comprises a cage wall having perforated zones and non-perforated zones.

50. (Previously Presented) The bone implantable device according to claim 38 wherein:

said biologically active substance comprises a dissolvable material.

51. (Previously Presented) The bone implantable device according to claim 38 wherein:

said biologically active substance comprises a crystalline material.

52. (Previously Presented) The bone implantable device according to claim 38 wherein:

said biologically active substance comprises a gel material.

53. (Currently Amended) A method of implanting a bone implantable device comprising the steps of:

pre-loading a carrier doped with a fluidal biologically active substance into a

carrier receiving area of a bone implantable device;

implanting the bone implantable device adjacent a target bone structure for facilitating a migration of said biologically active substance into contact with said target bone structure but otherwise confining the biologically active substance within the device.

54. (Previously Presented) The method according the claim 53 wherein:

said migration of said biologically active substance is promoted by body fluid contact.

55. (Previously Presented) The method according the claim 53 wherein:

said migration of said biologically active substance is promoted by body heat.

56. (New) An implantable device for locating within a body, said implantable device comprising:

a body defining an outside surface;

a carrier receiving area defined by said body;

an un-doped carrier material loaded in said carrier receiving area;

a port that communicates said outside surface with said carrier receiving area for facilitating delivery of a biologically active substance onto said un-doped carrier material;

a pathway that communicates with said carrier receiving area for delivering said biologically active substance from said carrier receiving area to a target bone structure;

a plug in said port adapted to be penetrated by a syringe; and

the interbody spine fusion cage further comprising:

a substantially solid end cap on an end of said cage body wherein said end cap encloses said carrier receiving area; and

wherein said port is defined by said end cap.

57. (New) A bone implantable device for locating adjacent a target bone structure, said bone implantable device comprising:

a body defining an outside surface;

a carrier receiving area defined by said body;

a pre-loaded carrier material in said carrier receiving area, said pre-loaded

carrier material comprising a biologically active substance;

a pathway that communicates with said carrier receiving area for delivering said biologically active substance from said carrier receiving area to the target bone structure;

a plug in said port adapted to be penetrated by a syringe; and

the interbody spine fusion cage further comprising:

a substantially solid end cap on an end of said cage body wherein said end cap encloses said carrier receiving area; and

wherein said port is defined by said end cap.

58. (New) An interbody spine fusion cage for fusing adjacent vertebrae, said spinal fusion cage comprising:

a cage body defining an outside surface;

a carrier receiving area defined by said cage body;

an un-doped collagen carrier material loaded in said carrier receiving area;

a port that communicates said outside surface with said carrier receiving area for facilitating delivery of a biologically active substance onto said un-doped carrier material;

a pathway that communicates with said carrier receiving area for delivering said biologically active substance from said carrier receiving area to a target bone structure.

59. (New) The interbody spine fusion cage according to claim 58 further comprising:

a plug in said port adapted to be penetrated by a syringe;

a substantially solid end cap on an end of said cage body wherein said end cap encloses said carrier receiving area; and

wherein said port is defined by said end cap.

60. (New) An implantable device for locating within a body, said implantable device comprising:

a body defining an outside surface;

a carrier receiving area defined by said body;

an un-doped collagen carrier material loaded in said carrier receiving area;

a port that communicates said outside surface with said carrier receiving area for facilitating delivery of a biologically active substance onto said un-doped carrier material;

a pathway that communicates with said carrier receiving area for delivering said biologically active substance from said carrier receiving area to a target bone structure.

61. (New) The implantable device according to claim 60 further comprising:

a plug in said port adapted to be penetrated by a syringe; and

the interbody spine fusion cage further comprising:

a substantially solid end cap on an end of said cage body wherein said end cap encloses said carrier receiving area; and

wherein said port is defined by said end cap.

62. (New) An implantable device for locating within a body, said implantable device comprising:

a body defining an outside surface;

a carrier receiving area defined by said body;

an un-doped, sponge material loaded in said carrier receiving area;

a port that communicates said outside surface with said carrier receiving area for facilitating delivery of a biologically active substance onto said un-doped carrier

material;

a pathway that communicates with said carrier receiving area for delivering said biologically active substance from said carrier receiving area to a target bone structure.

63. (New) The implantable device according to claim 62 further comprising:

a plug in said port adapted to be penetrated by a syringe; and

the interbody spine fusion cage further comprising a substantially solid end cap on an end of said cage body wherein said end cap encloses said carrier receiving area; and

wherein said port is defined by said end cap.

64. (New) A bone implantable device for locating adjacent a target bone structure, said bone implantable device comprising:

a body defining an outside surface;

a carrier receiving area defined by said body;

a pre-loaded collagen carrier material in said carrier receiving area, said pre-loaded collagen carrier material comprising a biologically active substance;

a pathway that communicates with said carrier receiving area for delivering said biologically active substance from said carrier receiving area to the target bone structure.

65. (New) The implantable device according to claim 64 further comprising:

a plug in said port adapted to be penetrated by a syringe; and

the interbody spine fusion cage further comprising:

a substantially solid end cap on an end of said cage body wherein said end cap encloses said carrier receiving area; and

wherein said port is defined by said end cap.

66. (New) A bone implantable device for locating adjacent a target bone structure, said bone implantable device comprising:

a body defining an outside surface;

a carrier receiving area defined by said body;

a pre-loaded carrier material in said carrier receiving area, said pre-loaded sponge material comprising a biologically active substance;

a pathway that communicates with said carrier receiving area for delivering

said biologically active substance from said carrier receiving area to the target bone structure.

67. (New) The implantable device according to claim 66 further comprising:

a plug in said port adapted to be penetrated by a syringe; and

the interbody spine fusion cage further comprising:

a substantially solid end cap on an end of said cage body wherein said end cap encloses said carrier receiving area; and

wherein said port is defined by said end cap.

68. (New) The method of implanting a bone implantable device according to claim 53 wherein said fluid is liquid.

69. (New) The method of implanting a bone implantable device according to claim 53 wherein said fluid is a gel.

70. (New) A method of implanting a bone implantable device comprising the steps of:

pre-loading into a carrier receiving area of a bone implantable device a

carrier doped with a dissolvable biologically active substance that liquifies after contact with body fluids;

implanting the bone implantable device adjacent a target bone structure for facilitating a migration of said biologically active substance into contact with said target bone structure but otherwise confining the biologically active substance within the device.

71. (New) A method of implanting a bone implantable device comprising the steps of:

implanting a bone implantable device adjacent a target bone structure;

applying a fluidal bone growth agent into said bone implantable device;

facilitating migration of said fluidal bone growth agent to said target bone structure by otherwise confining the bone growth agent within said device.

72. (New) An interbody spine fusion cage according to claim 21 wherein:

said delivery device is a syringe.